IN THE CLAIMS:

1. (Currently Amended) A method for enabling parity declustering in a balanced parity array of a storage system, comprising:

combining a plurality of unbalanced parity stripe arrays, ~~each unbalanced parity stripe array storing an unequal number of parity blocks per disk,~~ to form the balanced parity array, the balanced parity array storing substantially the same number of parity blocks on all disks, each unbalanced parity stripe array and the balanced parity array having parity blocks on a set of storage devices that are disjoint from a set of storage devices storing data blocks, <u>wherein each unbalanced parity stripe array is an arrangement having fewer parity blocks per disk than data blocks per disk in a stripe</u>; and

distributing assignment of storage devices to parity groups throughout the balanced parity array.

2. (Previously Presented) The method of Claim 1 further comprising, after a single or double storage device failure, ensuring that all surviving data storage devices are loaded uniformly during reconstruction of the failed storage device or devices.

3. (Original) The method of Claim 1 wherein the storage system is a filer.

4. (Currently Amended) The method of Claim 1 further comprising:

dividing each storage device into blocks; and

organizing the blocks into stripes across the devices, wherein each stripe contains data and parity blocks from each of the devices of a balanced array, where the balanced array includes the set of storage devices to store data blocks and the set of storage devices to store parity block<u>s</u>.

5. (Currently Amended) The method of Claim 4 wherein the step of ~~distributing~~ orga-nizing comprises selecting patterns of characters representing data storage devices of ~~a~~ each stripe to thereby change the association of the data storage devices with parity groups from stripe to stripe of the balanced array.

6. (Original) The method of Claim 5 wherein the characters are binary numbers.

7. (Original) The method of Claim 5 wherein the characters are ternary numbers.

8. (Previously Presented) The method of Claim 1 further comprising:

   configuring the balanced array as a RAID-4 style array;

   initially under-populating the array with storage devices; and

   adding storage devices until a fully populated array of predetermined size is achieved.

9. (Original) The method of Claim 8 wherein the storage devices are disks.

10. (Currently Amended) A system that enables parity declustering in a balanced parity array of a storage system, the system comprising:

   a plurality of storage devices, each storage device divided into blocks that are fur-ther organized into stripes, wherein each stripe contains data and parity blocks from each of the devices of a balanced array;

   a storage operating system including a storage layer configured to implement a parity assignment technique that distributes assignment of devices to parity groups throughout the balanced array such that all storage devices contain the same amount of information; and

   a processing element configured to execute the operating system to thereby in-voke storage access operations to and from the balanced parity array in accordance with a concentrated parity technique, where the concentrated parity technique combines unbal-

¹³ anced parity stripe arrays from two or more of the parity groups to form a balanced parity

¹⁴ array with an equal number of parity blocks per disk storing parity, wherein each unbal-

¹⁵ anced parity stripe array is an arrangement having fewer parity blocks per disk than data

¹⁶ blocks per disk in the stripe.

¹ 11. (Previously Presented) The system of Claim 10 wherein each unbalanced stripe ar-

² ray having parity blocks on a set of storage devices that are disjoint from a set of storage

³ devices storing data blocks.

¹ 12. (Original) The system of Claim 11 wherein the storage devices are disks and

² wherein the storage layer is a RAID layer.

¹ 13. (Original) The system of Claim 12 wherein the RAID layer is implemented in logic

² circuitry.

¹ 14. (Original) The system of Claim 10 wherein the storage system is a network-attached

² storage appliance.

¹ 15. (Original) The system of Claim 10 wherein the storage devices are one of video

² tape, optical, DVD, magnetic tape and bubble memory devices.

¹ 16. (Original) The system of Claim 10 wherein the storage devices are media adapted to

² store information contained within the data and parity blocks.

¹ 17. (Currently Amended) Apparatus for enabling parity declustering in a balanced parity

² array of a storage system, the apparatus comprising:

³ means for combining a plurality of unbalanced parity stripe arrays, each unbal-

⁴ anced parity stripe array storing an unequal number of parity blocks per disk, to form the

⁵ balanced parity array, the balanced parity array storing substantially the same number of

6 parity blocks on all disks, each unbalanced parity stripe array and the balanced parity ar-

7 ray having parity blocks on a set of storage devices that are disjoint from a set of storage

8 devices storing data blocks, wherein the unbalanced parity stripe array is an arrangement

9 having fewer parity blocks per disk than data blocks per disk in a stripe; and

10   means for distributing assignment of devices to parity groups throughout the bal-

11 anced parity array.

1 18. (Currently Amended) The apparatus of Claim 17 further comprising:

2   means for dividing each storage device into blocks; and

3   means for organizing the blocks into stripes across the devices, wherein each

4 stripe contains data and parity blocks from each of the devices of a balanced array,

5 where the balanced array includes the set of storage devices to store data blocks and the

6 set of storage devices to store parity block~~s~~.

1 19. (Currently Amended) The apparatus of Claim 18 wherein the means for ~~distributing~~

2 organizing comprises means for selecting patterns of characters representing data storage

3 devices of ~~a~~ each stripe to thereby change the association of the data storage devices with

4 parity groups from stripe to stripe of the balanced array.

1 20. (Currently Amended) A computer readable medium containing executable program

2 instructions for enabling parity declustering in a balanced parity array of a storage sys-

3 tem, the executable program instructions comprising program instructions for:

4   combining a plurality of unbalanced parity stripe arrays~~, each unbalanced parity~~

5 ~~stripe array storing an unequal number of parity blocks per disk,~~ to form the balanced

6 parity array, the balanced parity array storing substantially the same number of parity

7 blocks on all disks, each unbalanced parity stripe array and the balanced parity array hav-

8 ing parity blocks on a set of storage devices that are disjoint from a set of storage devices

9 storing data blocks, wherein each unbalanced parity stripe array storing an unequal num-

10 ber of parity blocks per storage device then data blocks per storage device in a stripe; and

11 distributing assignment of devices to parity groups throughout the balanced parity

12 array.

1 21. (Currently Amended) The computer readable medium of Claim 20 further compris-

2 ing program instructions for:

3 dividing each storage device into blocks; and

4 organizing the blocks into stripes across the devices, wherein each stripe contains

5 data and parity blocks from each of the devices of a balanced array, where the balanced

6 array includes the set of storage devices to store data blocks and the set of storage devices

7 to store parity block~~s~~.

1 22. (Currently Amended) The computer readable medium of Claim 21 wherein the pro-

2 gram instructions for ~~distributing~~ organizing comprises program instructions for selecting

3 patterns of characters representing data storage devices of ~~a~~ each stripe to thereby change

4 the association of the data storage devices with parity groups from stripe to stripe of the

5 balanced array.

1 23. –37. (Cancelled)

1 38. (Currently Amended) A method for declustering a parity array having a plurality of

2 storage devices, comprising:

3 assigning a first plurality of data and parity blocks to a first group, where the data

4 blocks are stored on a plurality of storage devices that are disjoint from a plurality of

5 storage devices storing parity blocks to form a first parity group, wherein the parity

6 blocks are striped across the plurality of storage devices in the first parity group with ~~an~~

7 ~~uneven number of parity blocks per each storage device~~ fewer parity blocks per storage

8 device than data blocks per storage device in a stripe;

9 assigning a second plurality of data and parity blocks to a second group, where

10 the data blocks are stored on a plurality of storage devices that are disjoint from a plural-

11 ity of storage devices storing parity blocks to form a second parity group, wherein the

12 parity blocks are striped across the plurality of storage devices in the second parity group

13 with ~~an uneven number of parity blocks per each storage device~~ fewer parity blocks per

14 storage device than data blocks per storage device in a stripe, wherein the first and second

15 parity groups being independent from each other; and

16   combining the first parity group and the second parity group to form a balanced

17 parity array, the balanced parity array storing substantially the same number of parity

18 blocks on the storage devices configured to store parity.

1 39. (Cancelled)

1 40. (Currently Amended) A method for declustering a parity array having a plurality of

2 storage devices, comprising:

3   assigning a plurality of parity blocks to a plurality of parity groups, the plurality

4 of parity groups being independent from each other and distributed throughout the plural-

5 ity of storage devices of the parity array where each parity group forms an unbalanced

6 parity stripe array, wherein each unbalanced parity array has fewer parity blocks per stor-

7 age device than data blocks per storage device in a stripe; and

8   combining the plurality of parity groups to form a balanced array, the balanced ar-

9 ray storing substantially the same number of blocks on all disks.

1 41. (Currently Amended) A disk array having a declustered parity array, comprising:

2   a plurality of storage devices having a first and second parity group;

3   a first plurality of parity blocks assigned to the first parity group where the first

4 parity group forms a first unbalanced parity stripe array, wherein the first unbalanced par-

5 ity array has fewer parity blocks per disk than data blocks per disk in a stripe;

6   a second plurality of parity blocks assigned to the second parity group where the

7 second parity group forms a second unbalanced parity stripe array, wherein the second

8 unbalanced parity array has fewer parity blocks per disk than data blocks per disk in a

9   stripe, the first and second parity groups being independent from each other and distrib-

10   uted throughout the plurality of storage devices of the parity array; and

11   a balanced parity array created by combining the first parity group and the second

12   parity group, the balanced parity array storing substantially the same number of blocks on

13   all disks.

1   42. (Cancelled)

1   43. (Currently Amended) A disk array having a declustered parity array, comprising:

2   a plurality of storage devices having a plurality of parity groups;

3   a plurality of parity blocks assigned to the plurality of parity groups where each

4   parity group forms an unbalanced parity stripe array, wherein each unbalanced parity ar-

5   ray has fewer parity blocks per storage device than data blocks per storage device in a

6   stripe, the plurality of parity groups being independent from each other and distributed

7   throughout the plurality of storage devices of the parity array; and

8   a balanced parity array created by combining the plurality parity groups, the bal-

9   anced parity array storing substantially the same number of parity blocks on all disks.

1   44. (Currently Amended) A disk array having a declustered parity array, comprising:

2   a plurality of storage devices;

3   means for assigning a first plurality of parity blocks to a first parity group where

4   the first parity group forms a first unbalanced parity stripe array, wherein the first unbal-

5   anced parity array has fewer parity blocks per storage device than data blocks per storage

6   device in a stripe;

7   means for assigning a second plurality of parity blocks to a second parity group,

8   where the second parity group forms a second unbalanced parity stripe array, wherein the

9   second unbalanced parity array has fewer parity blocks per storage device than data

10   blocks per storage device in a stripe, the first and second parity groups being independent

11   from each other and distributed throughout the plurality of storage devices of the parity

12   array; and

13   means for combining the first parity group and the second parity group to form a

14   balanced parity array, the balanced parity array storing substantially the same number of

15   parity blocks on all disks.

1   45. (Cancelled)

1   46. (Currently Amended) A disk array having a declustered parity array, comprising:

2   a plurality of storage devices;

3   means for assigning a plurality of parity blocks to a plurality of parity groups, the

4   plurality of parity groups being independent from each other and distributed throughout

5   the plurality of storage devices of the parity array <u>where each parity group forms an un-</u>

6   <u>balanced parity stripe array, wherein each unbalanced parity array has fewer parity blocks</u>

7   <u>per storage device than data blocks per storage device in a stripe</u>; and

8   means for combining the plurality of parity groups to form a balanced parity ar-

9   ray, the balanced parity array storing substantially the same number of parity blocks on

10   all disks.

1   47. – 54. (Cancelled)

1   55. (Currently Amended) A computer implemented method for enabling parity declus-

2   tering of a storage system, comprising:

3   providing a first array of storage devices for storing data blocks and parity blocks,

4   the data blocks organized into at least one parity group associated with the parity blocks,

5   the first array ~~storing an unequal number of parity blocks on differing ones of the storage~~

6   ~~devices~~<u>forming a first unbalanced parity stripe array, wherein the first unbalanced parity</u>

7   <u>array has fewer parity blocks per storage device than data blocks per storage device in a</u>

8   <u>stripe</u>;

9   providing a second array of storage devices for storing data blocks and parity

10   blocks, the data blocks organized into at least one parity group associated with the parity

11   blocks, the second array ~~storing an unequal number of parity blocks on differing ones of~~

12   ~~the storage devices~~ forming a second unbalanced parity stripe array, wherein the second

13   unbalanced parity array has fewer parity blocks per storage device than data blocks per

14   storage device in a stripe;

15   combining the first and second arrays to form a combined array having substan-

16   tially the same number of parity blocks stored on each storage device of the combined

17   array; and

18   changing the association of data blocks with parity groups in the first array and

19   the second array so that each parity group is associated with data blocks that are distrib-

20   uted substantially uniformly throughout the storage devices that store data blocks in the

21   combined array.

1   56. (Previously Presented) The method of claim 55 further comprising:

2   organizing the data and parity blocks into stripes across the storage devices.

1   57. (Previously Presented) The method of claim 56 wherein the step of redistributing

2   comprises changing the association of the data storage devices with parity groups from

3   stripe to stripe in the combined array.

1   58. (Currently Amended) The method of claim 57 wherein the step of changing further

2   comprises selecting differing patterns of characters representing data storage devices of ~~a~~

3   each stripe.

1   59. (Previously Presented) The method of claim 58 wherein the characters are binary

2   numbers.

1   60. (Previously Presented) The method of claim 58 wherein the characters are ternary

2   numbers.

1   61. (Previously Presented) The method of claim 55 wherein the storage devices are disk

2   drives.

1   62. (Previously Presented) A computer implemented method for enabling parity declus-

2   tering of a storage array having a plurality of storage devices, comprising:

3   dividing each storage device into blocks;

4   organizing the blocks into a plurality of stripes across the storage devices,

5   wherein each stripe contains data and parity blocks;

6   storing data in data blocks and parity information in parity blocks, the parity

7   blocks storing parity information for a plurality of parity groups; and

8   varying the association of the storage devices to parity groups from stripe to stripe

9   in the storage array such that each parity group is associated with data blocks that are dis-

10   tributed substantially uniformly throughout the storage devices that store data blocks in

11   the storage array.

1   63. (Currently Amended) The method of claim 62 wherein the step of ~~changing~~ varying

2   comprises selecting differing patterns of characters representing data storage devices of a

3   stripe to thereby change the association of data blocks with parity groups from stripe to

4   stripe of the storage array.

1   64. (Currently Amended) An apparatus for enabling parity declustering of a storage sys-

2   tem, the apparatus comprising:

3   a first array of storage devices for storing data blocks and parity blocks, the data

4   blocks organized into at least one parity group associated with the parity blocks, the first

5   array ~~storing an unequal number of blocks on differing ones of the storage devices~~ form-

11

6 ing a first unbalanced parity stripe array, wherein the first unbalanced parity array has

7 fewer parity blocks per storage device than data blocks per storage device in a stripe;

8   a second array of storage devices for storing data blocks and parity blocks, the

9 data blocks organized into at least one parity group associated with the parity blocks, the

10 second array ~~storing an unequal number of blocks on differing ones of the storage devices~~

11 forming a second unbalanced parity stripe array, wherein the second unbalanced parity

12 array has fewer parity blocks per storage device than data blocks per storage device in a

13 stripe; and

14   a storage operating system configured to combine the first and second arrays to

15 form a combined array having substantially the same number of blocks stored on each

16 storage device of the combined array, and configured to change the association of data

17 blocks with parity groups in the first array and the second array so that each parity group

18 is associated with data blocks that are distributed substantially uniformly throughout the

19 storage devices that store data blocks in the combined array.

1 65. (Previously Presented) The apparatus of claim 64 wherein each the blocks are organ-

2 ized into stripes across the storage devices.

1 66. (Previously Presented) The apparatus of claim 65 wherein the storage devices are

2 disk drives

1 67. (Previously Presented) The apparatus of claim 64 wherein the storage devices are

2 one of video tape, optical, DVD, magnetic tape and bubble memory devices.

1 68. (Previously Presented) The apparatus of claim 64 wherein the system is a network-

2 attached storage appliance.

1 69. (Currently Amended) An apparatus for enabling parity declustering of a storage ar-

2 ray having a plurality of storage devices, the ~~system~~ apparatus comprising:

3   a storage operating system configured to divide each storage device into blocks

4   and organize the blocks into a plurality of stripes across the storage devices, wherein each

5   stripe contains data and parity blocks and store data in data blocks and parity information

6   in parity blocks, the parity blocks storing parity information for a plurality of parity

7   groups; and

8   the storage operating system further configured to vary the association of the stor-

9   age devices to parity groups from stripe to stripe in the storage array such that, each par-

10   ity group is associated with data blocks that are distributed substantially uniformly

11   throughout the storage devices that store data blocks in the storage array.

1   70. (Previously Presented) The system of claim 68 wherein the storage operating system

2   is configured to select differing patterns of characters representing data storage devices of

3   a stripe to thereby change the association of data blocks with parity groups from stripe to

4   stripe of the storage array.

1   71. (Currently Amended)   A system that enables parity declustering of a storage system,

2   the system comprising:

3   means for providing a first array of storage devices for storing data blocks and

4   parity blocks, the data blocks organized into at least one parity group associated with the

5   parity blocks, the first array ~~storing an unequal number of blocks on differing ones of the~~

6   ~~storage devices~~ forming a first unbalanced parity stripe array, wherein the first unbal-

7   anced parity array has fewer parity blocks per storage device than data blocks per storage

8   device in a stripe;

9   means for providing a second array of storage devices for storing data blocks and

10   parity blocks, the data blocks organized into at least one parity group associated with the

11   parity blocks, the second array ~~storing an unequal number of blocks on differing ones of~~

12   ~~the storage devices~~ forming a second unbalanced parity stripe array, wherein the second

13   unbalanced parity array has fewer parity blocks per storage device than data blocks per

14   storage device in a stripe;

15   means for combining the first and second arrays to form a combined array having

16   substantially the same number of blocks stored on each storage device of the combined

17   array; and

18   means for changing the association of data blocks with parity groups in the first

19   array and the second array so that each parity group is associated with data blocks that are

20   distributed substantially uniformly throughout the storage devices that store data blocks

21   in the combined array.

1   72. (Currently Amended) An apparatus for enabling parity declustering of a storage ar-

2   ray having a plurality of storage devices, the ~~system~~ apparatus comprising:

3   means for dividing each storage device into blocks;

4   means for organizing the blocks into a plurality of stripes across the storage de-

5   vices, wherein each stripe contains data and parity blocks;

6   means for storing data in data blocks and parity information in parity blocks, the

7   parity blocks storing parity information for a plurality of parity groups; and

8   means for varying the association of the storage devices to parity groups from

9   stripe to stripe in the storage array such that, each parity group is associated with data

10   blocks that are distributed substantially uniformly throughout the storage devices that

11   store data blocks in the storage array.

1   73. (Previously Presented)   A computer readable medium containing program instruc-

2   tions for execution on a processor, the executable program instructions comprising pro-

3   gram instructions for:

4   dividing each storage device into blocks;

5   organizing the blocks into a plurality of stripes across the storage devices,

6   wherein each stripe contains data and parity blocks;

7   storing data in data blocks and parity information in parity blocks, the parity

8   blocks storing parity information for a plurality of parity groups; and

9   varying the association of the storage devices to parity groups from stripe to stripe

10   in the storage array such that, each parity group is associated with data blocks that are

11   distributed substantially uniformly throughout the storage devices that store data blocks

12   in the storage array.

1   74. (Previously Presented) The apparatus of claim 17 wherein each unbalanced stripe

2   array has fewer parity blocks per disk than data blocks per disk.

1   75. (Previously Presented) The computer readable medium of claim 20 wherein each un-

2   balanced stripe array has fewer parity blocks per disk than data blocks per disk.

1   76. (Currently Amended) An apparatus for parity declustering in a storage system, the

2   apparatus comprising:

3   a storage operating system configured to combine a plurality of first arrays of

4   storage devices, each first array ~~storing an unequal number of blocks per storage device~~

5   <u>has fewer parity blocks per storage device than data blocks per storage device in a stripe</u>,

6   to form a second array, the second array storing substantially the same number of parity

7   blocks on storage devices that store parity blocks; and

8   the storage operating system further configured to redistribute the assignment

9   storage devices to parity groups in the second array so that each storage device will have

10   a substantially equal number of blocks associated with each parity group.

1   77. (Currently Amended) An method for parity declustering in a storage system, com-

2   prising:

3   combining a plurality of first arrays of storage devices, each first array ~~storing an~~

4   ~~unequal number of blocks per storage device, to form a second array~~ <u>has fewer parity</u>

5   <u>blocks per storage device than data blocks per storage device in a stripe</u>, the second array

6   storing substantially the same number of parity blocks on storage devices that store parity

7   blocks; and

8   configuring the storage operating system to redistribute the assignment storage

9   devices to parity groups in the second array so that each storage device will have a sub-

10   stantially equal number of blocks associated with each parity group.

1   78. (Currently Amended) A computer implemented method for enabling parity declus-

2   tering of a storage system, comprising:

3   providing a first array of storage devices for storing data blocks and parity blocks,

4   the data blocks organized into at least one parity group associated with the parity blocks,

5   the first array ~~storing an unequal number of parity blocks on differing ones of the storage~~

6   ~~devices~~ forming a first unbalanced parity stripe array, wherein the first unbalanced parity

7   array has fewer parity blocks per storage device than data blocks per storage device in a

8   stripe;

9   providing a second array of storage devices for storing data blocks and parity

10   blocks, the data blocks organized into at least one parity group associated with the parity

11   blocks, the second array ~~storing an unequal number of parity blocks on differing ones of~~

12   ~~the storage devices~~forming a second unbalanced parity stripe array, wherein the second

13   unbalanced parity array has fewer parity blocks per storage device than data blocks per

14   storage device in a stripe; and

15   combining the first and second arrays to form a combined array having substan-

16   tially the same number of parity blocks stored on each storage device of the combined

17   array.

1   79. (Currently Amended) An apparatus for enabling parity declustering of a storage sys-

2   tem, the apparatus comprising:

3   a first array of storage devices for storing data blocks and parity blocks, the data

4   blocks organized into at least one parity group associated with the parity blocks, the first

5   array ~~storing an unequal number of parity blocks on differing ones of the storage devices~~

6   forming a first unbalanced parity stripe array, wherein the first unbalanced parity array

7   has fewer parity blocks per storage device than data blocks per storage device in a stripe;

8   a second array of storage devices for storing data blocks and parity blocks, the

9   data blocks organized into at least one parity group associated with the parity blocks, the

10   second array ~~storing an unequal number of parity blocks on differing ones of the storage~~

11   ~~devices~~ forming a second unbalanced parity stripe array, wherein the second unbalanced

12   parity array has fewer parity blocks per storage device than data blocks per storage device

13   in a stripe; and

14   a storage operating system configured to combine the first and second arrays to

15   form a combined array having substantially the same number of parity blocks stored on

16   each storage device of the combined array.

1   80. (Currently Amended) A method for enabling a balanced arrangement of a storage sys-

2   tem, comprising:

3   creating a plurality of unbalanced stripe arrangements with each unbalanced stripe

4   arrangement ~~storing an unequal number of parity blocks per disk in an array of disks~~ is an

5   arrangement having fewer parity blocks per disk than data blocks per disk in a stripe;

6   combining the plurality of unbalanced stripe arrangements to form the balanced

7   arrangement, with the balanced arrangement storing substantially the same number of

8   parity blocks per disk in the array of disks configured to store parity;

9   storing parity blocks across one or more disks in the array of disks to create one or

10   more parity groups;

11   storing data blocks across the remaining disks of the disks in the array with the

12   parity blocks and the data blocks stored on different disks of the array; and

13   assigning storage devices to different parity groups throughout the balanced ar-

14   rangement.

1   81. (Currently Amended) A method for enabling a balanced arrangement of a storage sys-

2   tem, comprising:

creating a plurality of unbalanced stripe arrangements with each unbalanced stripe

arrangement ~~storing an unequal number of parity blocks per disk in an array of disks~~ has

fewer parity blocks per disk than data blocks per disk in a stripe; and

combining the plurality of unbalanced stripe arrangements to form the balanced

arrangement, with the balanced arrangement storing substantially the same number of

parity blocks per disk in the array of disks configured to store parity.

82. (Currently Amended) A method for enabling parity declustering in a balanced parity

array of a storage system, comprising:

combining a plurality of unbalanced parity stripe arrays from a plurality of RAID

groups~~, each unbalanced parity stripe array storing an unequal number of parity blocks~~

~~per disk,~~ to form the balanced parity array, the balanced parity array storing substantially

the same number of parity blocks on all disks, each unbalanced parity stripe array and the

balanced parity array having parity blocks on a set of storage devices that are disjoint

from a set of storage devices storing data blocks, wherein each unbalanced parity stripe

array is an arrangement having fewer parity blocks per storage device than data blocks

per storage device in a stripe; and

distributing assignment of storage devices to parity groups throughout the bal-

anced parity array.

83. (Previously Presented) The method of Claim 1 further comprising:

after a single or double storage device failure, ensuring that all surviving data

storage devices are loaded uniformly during reconstruction of the failed storage device or

devices.

1   Please add new claim 84

1   84. (New) A method, comprising:

2   providing a first array of storage devices for storing data blocks and parity blocks,

3   the data blocks organized into at least one parity group associated with the parity blocks,

4   the first array forming a first unbalanced parity stripe array, wherein the first unbalanced

5   parity array has fewer parity blocks per storage device than data blocks per storage device

6   in a stripe;

7   providing a second array of storage devices for storing data blocks and parity

8   blocks, the data blocks organized into at least one parity group associated with the parity

9   blocks, the second array forming a second unbalanced parity stripe array, wherein the

10   second unbalanced parity array has fewer parity blocks per storage device than data

11   blocks per storage device in the stripe;

12   determining to combine the first array and the second array when a number of

13   parity blocks per a storage device divides evenly into a number of data blocks per stor-

14   age device in the stripe; and

15   in response to determining to combine the first array and the second array, com-

16   bining the first and second arrays to form a combined array having substantially the same

17   number of parity blocks stored on each storage device of the combined array.